

Application Number 10/825,955
Amendment in response to Final Office Action mailed May 6, 2008

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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): A method comprising:

monitoring a plurality of physiological parameters of a patient via a medical device, wherein the plurality of physiological parameters includes at least one parameter indicative of patient physical activity monitored via at least one accelerometer;

determining when the patient is attempting to sleep;

determining when the patient is asleep based on at least one of the physiological parameters;

determining values of at least one sleep quality metric that is indicative of sleep quality based on at least one of when the patient is attempting to sleep, when the patient is asleep, or values of at least one of the physiological parameters when the patient is attempting to sleep asleep;

periodically determining an activity level of the patient based on the at least one of the physiological parameters indicative of patient physical activity that is monitored via the at least one accelerometer; and

determining a value of at least one activity metric based on activity levels determined when the patient is not attempting to sleep.

Claim 2 (Original): The method of claim 1, wherein determining when the patient is attempting to sleep comprises receiving an indication from the patient that the patient is attempting to sleep.

Claim 3 (Previously Presented): The method of claim 1, wherein monitoring a plurality of physiological parameters comprises monitoring at least one signal that indicates posture of the patient, and determining when the patient is attempting to sleep comprises determining when the patient is recumbent.

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Claim 4 (Currently Amended): The method of claim 3,

wherein the at least one accelerometer comprises a plurality of orthogonally aligned accelerometers, and

wherein monitoring at least one signal comprises monitoring a signal from each of a the plurality of orthogonally aligned accelerometers, and determining when the patient is recumbent comprises determining when the patient is recumbent based on a DC component of each of the signals.

Claim 5 (Currently Amended): The method of claim 1, wherein determining when the patient is attempting to sleep comprises determining when the patient is attempting to sleep based on a ~~physical~~ the activity levels of the patient.

Claim 6 (Currently Amended): The method of claim 5, wherein determining when the patient is attempting to sleep based on ~~an~~ the activity levels comprises:

comparing the activity levels to an activity level threshold; and

comparing an amount of time that the activity levels remains substantially below the activity level threshold to a time threshold.

Claim 7 (Withdrawn): The method of claim 1, wherein monitoring a plurality of physiological parameters comprising monitoring a level of melatonin within a bodily fluid, and determining when the patient is attempting to sleep comprises determining when the patient is attempting to sleep based on the melatonin level.

Claim 8 (Previously Presented): The method of claim 1, wherein monitoring a plurality of physiological parameters comprises monitoring at least one of posture, heart rate, respiration rate, respiratory volume, or core temperature.

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Claim 9 (Previously Presented): The method of claim 1, wherein monitoring a plurality of physiological parameters comprises monitoring at least one of blood pressure, blood oxygen saturation, partial pressure of oxygen within blood, partial pressure of oxygen within cerebrospinal fluid, muscular activity, arterial blood flow, or galvanic skin response.

Claim 10 (Withdrawn – Currently Amended): The method of claim 1, wherein the sleep quality metric comprises sleep efficiency, and determining values of the sleep quality metric comprises ~~comprises:~~

~~determining when the patient is asleep based on at least one of the physiological parameters; and~~

determining a percentage of time that the patient is asleep while the patient is attempting to sleep.

Claim 11 (Currently Amended): The method of claim 1, wherein the sleep quality metric comprises sleep latency, and determining values of the sleep quality metric comprises:

identifying a first time when the patient is attempting to fall asleep;

identifying a second time when the patient falls asleep ~~based on at least one of the physiological parameters; and~~

determining an amount of time between the first and second times.

Claim 12 (Currently Amended): The method of claim 1, wherein determining values of the sleep quality metric comprises ~~comprises:~~

~~identifying when the patient is asleep based on at least one of the physiological parameters; and~~

determining an amount of time that the patient is asleep during a period.

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Claim 13 (Withdrawn – Currently Amended): The method of claim 1, wherein determining values of the sleep quality metric ~~comprises~~ comprises:

~~identifying when the patient is asleep based on at least one of the physiological parameters; and~~

identifying at least one of a number of arousal events and a number of apnea events during a period of sleep.

Claim 14 (Original): The method of claim 1, wherein determining values of the sleep quality metric comprises:

identifying when the patient is within a sleep state based on at least one of the physiological parameters; and

determining an amount of time that the patient was within the sleep state.

Claim 15 (Original): The method of claim 14, wherein the sleep state comprises at least one of an S3 sleep state and an S4 sleep state.

Claim 16 (Canceled).

Claim 17 (Previously Presented): The method of claim 1, wherein determining a value of an activity metric comprises determining at least one of a mean and a median of determined activity levels.

Claim 18 (Original): The method of claim 17, wherein determining a value of an activity metric comprises:

comparing the at least one of the mean and the median activity level to at least one threshold; and

selecting the activity metric value from a plurality of predetermined possible activity metric values based on the comparison.

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Claim 19 (Previously Presented): The method of claim 1, wherein determining a value of an activity metric comprises:

comparing each of the activity levels to a threshold value; and

determining at least one of a percentage of time above the threshold and a percentage of time below the threshold.

Claim 20 (Previously Presented): The method of claim 1, wherein determining a value of an activity metric comprises:

comparing each of the activity levels to a threshold value; and

determining an average length of time that consecutively determined activity levels were above the threshold.

Claim 21 (Original): The method of claim 1, wherein periodically determining an activity level comprises periodically determining a number of activity counts.

Claim 22 (Withdrawn-Previously Presented): The method of claim 1, wherein the medical device delivers a therapy to the patient according to a plurality of therapy parameter sets, the method further comprising:

associating each of the determined sleep quality metric values and each of the determined activity levels with one or more of the plurality of therapy parameter sets that was used by the medical device to deliver therapy when that value or level was determined;

for each of the plurality of therapy parameter sets, determining a representative value of each of the at least one sleep quality metric based on the sleep quality metric values associated with the therapy parameter set; and

for each of the plurality of therapy parameter sets, determining at least one activity metric value based on the activity levels associated with the therapy parameter set.

Claim 23 (Withdrawn): The method of claim 22, further comprising presenting a list of the therapy parameter sets, associated representative sleep quality metric values, and associated activity metric values.

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Claim 24 (Withdrawn): The method of claim 23, further comprising ordering the list of therapy parameter sets according to values of a user selected one of the sleep quality metrics and activity metrics.

Claim 25 (Original): The method of claim 1, wherein the medical device comprises an implantable medical device.

Claim 26 (Withdrawn - Previously Presented): The method of claim 25, wherein the implantable medical device comprises at least one of an implantable neurostimulator and an implantable drug pump.

Claim 27 (Withdrawn): The method of claim 1, wherein the medical device comprises at least one of a trial neurostimulator and a trial pump.

Claims 28-71 (Canceled).

Claim 72 (New): The method of claim 1, further comprising indicating efficacy of a pain therapy based on the values of the at least one sleep quality metric and the value of the at least one activity metric.

Claim 73 (New): The method of claim 1, further comprising indicating efficacy of spinal cord stimulation based on the values of the at least one sleep quality metric and the value of the at least one activity metric.